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|-------------------------------|------------------------|---------------------|--|
| <b>Notice of Allowability</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                               | 09/228,148             | INOUE ET AL.        |  |
|                               | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                               | Julio J. Maldonado     | 2823                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to a communication filed on 03/11/2004.
2. ☒ The allowed claim(s) is/are 9-18.
3. ☒ The drawings filed on 11 January 1999 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance              |
|   | 9. <input type="checkbox"/> Other _____.   |

**DETAILED ACTION*****Allowable Subject Matter***

1. Claims 9-18 are allowed.
2. The following is an examiner's statement of reasons for allowance:

The prior art of record, Leong to U.S. 5,192,697 discloses sequential formation of conductive layer 12, oxide layer 13, 1000-2000 Å oxide/5000-6000 Å BPSG or PSG layer 16, conductive layer 20, 3000-4000 Å oxide layer 22, 2000-2400 Å SOG layer 24 and further oxide layer 26. Conductive layer 12 and layer 16 are patterned. The reference discloses implantation of Ar ions at a dose of  $5 \times 10^{-5}$  -  $1 \times 10^{16}$  cm<sup>-2</sup> and an energy of 40-140 KeV to cure layer 24. The reference indicates the energy and dose to affect breakdown voltage and volume shrinkage (col.4, lines 33-43 and col.5, lines 49-51). Applicant indicates that 140 KeV implantation through a 4000 Å SOG layer penetrates the layer (instant pages 14-16). Therefore, at least a portion of the range of energies disclosed as suitable by Leong would penetrate the thickness of SOG disclosed by Leong. Applicant also indicates that 2000 Å of oxide is sufficient to substantially prevent penetration to the underlying metal. Therefore, the 3000-4000 Å oxide layer 22 would prevent ion penetration into conductive layer 20 and the 3000-4000 Å oxide layer 22 in combination with the 1000-2000 Å oxide/5000-6000 Å BPSG or PSG layer 16 would prevent penetration into conductive layer 12.

However, Leong fails to teach forming the intrusion prevention film to selectively cover said conductive layer as taught in claim 9, nor patterning said

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conductive layer and said intrusion prevention film simultaneously by using a same mask as taught in claim 18.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.

4. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (571) 272-1855. The fax number for this group is 703-872-9306 for before final submissions, 703-872-9306 for after final submissions and the customer service number for group 2800 is (703) 306-3329. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.

Julio J. Maldonado  
Patent Examiner  
Art Unit 2823

Julio J. Maldonado  
June 17, 2004

  
George Fourson  
Primary Examiner